ROYAL ASTRONOMICAL SOCIETY.

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Captain W. H. Smyth, R.N., President, in the Chair.

James Prior, Esq. Deputy Inspector of Naval Hospitals, and John Dickenson, Esq. of Abbott's Hill, were balloted for, and duly elected Fellows of the Society.

The following communications were read:—

I. On the Ephemerides of Jarchi, the Chaldean Months, and the derivation of *Orion* and his Dogs. By S. M. Drach, Esq.

The author suggests, on the authority of Weidler's *Historia Astronomiæ*, that the first astronomical tables and ephemerides published in Europe are those of Rabbi Solomon Jarchi, although still inedited. Jarchi is supposed by Dr. Jost to have lived from the years 1040 to 1105 (*Gesch. der Israel*, Vol. VI. p. 243).

The author then proceeds to the consideration of the passage of the book of Job, contained in the thirty-first and thirty-second verses of the thirty-eighth chapter: "Canst thou bind the sweet influences of *Pleiades*, or loose the bands of *Orion*? Canst thou bring forth *Mazzaroth* in his season? or canst thou guide *Arcturus* with his sons?" And he cites the opinion of the Rabbinical commentators for the meaning of each of the astronomical words contained in it.

He then gives from Buxtorf's *Lexicon* the meanings of the names of the Jewish months, and concludes that their calendar is founded on the agricultural occupations of the Chaldean shepherds, who were employed during winter in preparing the fleeces of their flocks for clothing, &c.

He thinks it not impossible that the numerical values of the names of the months indicate the number of days wherein celestial phenomena recur, mystically decomposed for priestly purposes; and he gives instances in which certain combinations of their values represent pretty nearly the synodical periods of some of the planets.

There is some reason for supposing that *Orion*, *Sirius*, and

Procyon, may be regarded as Hellenised Egyptian names by dropping the final syllables, and that they may be thus referred to the Chaldean dialect.

II. Extracts from a Letter to the President, dated Picket Berg, Cape of Good Hope, January 1, 1845, from C. Piazzi Smyth, Esq. Communicated by Captain Smyth.

Great Comet of 1844–5.

"Another splendid comet is at this moment astounding the southern hemisphere and displaying the most interesting series of phenomena, which are passing away unrecorded, because the Institution is still without sufficient means.

"The apparition of this comet, 1844–5, is just such an opportunity, such a crucial test of his theory, as Bessel is so ardently desirous of beholding, provided, however, as he would of course be, with a sufficient apparatus.

"During the nine first days of its appearance to this end of the colony generally, this comet was only seen once at the Royal Observatory on account of the clouds which form so frequently to the west, because Table Mountain is there; and, now the comet is going southward so very fast, that it will probably soon be out of reach of the equatoreal mounting of the telescope. This state of things has already supervened in the case of Mauvais' Comet, which has been observed since October, and is likely to be visible for a long time to come; but from the middle of December its south declination has been so great as to place it beyond the range of the instrument at the best times for observation. Now, therefore, a polar axis mounting is being hastily run up."

Meteorology.—"A large mountain is too generally associated in idea with constant clouds and storms; but two years' experience on great elevations at this end of the colony shews decidedly that the highest position is by no means, on that account solely, liable to most mist, or vexed with most wind: such effects depending more on the proximity of the sea, and the configuration of the neighbouring country.

"Winterhock-berg, 6500 feet high and 60 miles from the sea, had little wind and less mist; but one of its off-sets contains a *kloof*, or cleft, which serves as a vent for the wind which has been blowing up the Worcester and Tulbagh valleys; and, in this kloof, 1200 feet high, there is generally abundance of both wind and cloud,—the latter of that sort which is forming at the same time on the top of Table Mountain, 3600 feet high.

"Kamiesberg, 5500 feet high, a cold mountain, isolated in extensive warm plains, had little wind; but Klyp Rug-berg, only 1000 feet high, situated on the edge of a steppe dividing a cold region from a hot one, was subject to wind, violent and continual beyond example.

" In the plains there generally prevails during summer a certain degree of haziness and indistinctness in the atmosphere, highly prejudicial both to the definition and the intensity of any distant illuminated object. A residence on a high mountain shews that there is spread at such times over the whole lower country a stratum of dry fog to the depth of 3000 or 4000 feet, not affecting the dew-point, of a smoky colour, but so rare as to be unsuspected by a person immersed in it. When he is above its level the peaks of distant mountains in a similar condition appear well defined, and of an intense blue or purple colour, while all below is indistinct, dancing, and boiling, and overcome by a general murkish grey tint. This peculiar fog may last in summer two or three months; in the winter, only as many days, and it is then more rare and attains a greater height. It is usually formed gradually, and is at length precipitated or dissipated by rain; but it is sometimes very sudden, and apparently capricious both in appearance and disappearance; no other important changes being evident at the time.

" What this fog is seems a question very difficult to solve. An infinite number of substances on the surface of the earth are constantly giving out their peculiar vapours; even metals do so, a fact implied by their having a smell; for to be perceived in that manner, particles must be flying off from them as from camphor. How high do such vapours ascend in the atmosphere, how long do they remain suspended, and are they at times precipitated, or are they decomposed?

" Smoke appears to play a part, though, perhaps, a very small one, in the business. From the universal practice all over the colony of ' burning the land,' or the bush, there is seldom a week passes without there being numerous fires burning in one's neighbourhood. In clear, calm weather the smoke from one of these has been seen rising up, cumuliform, 3000 or 4000 feet in height, and then forming a level stratum sometimes fifty miles in length, and this has continued several days, the fire still burning and the calm still enduring. While the dry fog prevails, a smoke from the plains has been seen to rise up 4000 feet and be lost in the upper layers of this haze, while at the same time smoke from the top of a neighbouring mountain 6000 feet high, has only risen up about 200 feet, and has then slanted off *downwards* and mingled with the same.

" In clear weather, on Winterhock-berg the theodolite telescope (aperture 2 inches, power 25) has shewn a pile of rough stones (12 feet high, 12 feet broad at the base, and 3 at the top) on the Cedar mountains, nearly seventy miles distant, so clearly, that an object one-third the breadth of the top would have been abundantly visible. From the same station a man was seen on Picket Berg, 45 miles off; and on this, one of Hottentot's Holland Sneew Kop, the spars at the Lion's Rump signal station (40 miles off), have been most clearly visible. And what is very deserving of notice is,

that some of the very best definition have been witnessed on these mountains in the middle of summer with a light northerly air; while at the same time, in the level country below, a strong south-east wind has been blowing with its usual accompaniment of large, faint, woolly blotches in the place of what ought to have appeared, viz. stellar points."

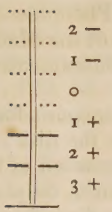
Magnitudes of Stars. — "Bessel's recommendation of steel specula reminds me of a series of astronomical phenomena that are passing unrecorded, viz. the changes in the magnitude of some stars.

"In March 1843, Mr. Mackay wrote from Calcutta to Sir John Herschel that η *Argus* had become as bright as *Canopus*, from which Sir John concluded that η was making another step forward, and would in time rival *Sirius* and the planets. But, after having for a few days in the beginning of the above-mentioned month approximated to *Canopus*, η dwindled down again very rapidly. But Sir John was not far out, for, although the star may not be advancing by successive steps, it seems to be doing the same by undulations; for, in March 1843, it did not go down to the point whence it started, and it is now again on the increase. It is, and has been for a month, brighter than *Canopus*, half way indeed between him and *Sirius*, and is very red.

"Not having been able yet to get my tourmalines applied to a telescope, I cannot report on their actual sufficiency for measuring the magnitudes of stars; the principle, however, seems to answer, inasmuch as a mode of observation is produced, in which the only variable element is angular motion.

"Numerical measurement of the periodical and secular changes in the *colour* of stars would seem to be as important as that of their *lustre*. My plan for doing it cannot be put into action without a clock-moved telescope. The principle is merely this: — a prism is to be introduced into the tube of a telescope so as to make the linear spectrum of a star, instead of the round white image to be viewed by the eye-piece. The mean yellow ray is to be brought by mechanical adjustments to a fixed point in the field, and, the spectrum being divided into a number of spaces of certain angular extent, the brightness of each is to be measured separately, as in the case of the *magnitudes* of the stars.

"White stars of all sizes will, of course, shew the same relative intensities in the different divisions of the spectrum; while coloured stars will exhibit a preponderance in the part which answers to their colour. To eliminate the differences of the effects of the atmosphere, and to determine what is white light, a method must be pursued similar to that in the discussion of the measurement of *magnitudes;* and the *colour* of the star will ultimately be expressed by numbers, without attempting to determine by what particular designation such a tint would be conceived by a person of ordinary eyesight.



" Let this be a spectrum divided into equal angular spaces of 2″ each, the one marked o being the yellow ray; by means of a perforated plate in the focus of the telescope, each of these portions is to be brought singly and successively into view, and have its brightness separately measured as a single star; the several portions of colour will then be represented thus:

	−2	−1	0	+1	+2	+3
Sirius.....	20	40	70	50	30	10
η Argus.....	30	80	40	20	10	0
Canopus.....	10	20	35	25	15	5

" The method is undoubtedly rough, and inapplicable to the smaller magnitudes of stars visible in any telescope, but if a measurement is obtained in numbers (free from theoretical objection), and capable of having the probable error computed, it should be adopted until something better can be advanced.

" It will not do for any one to tell the public, even in the case of the magnitudes of stars, that 'he has tried all instrumental methods, and found all to be inferior to estimation by the naked eye;' because, so long as such a method of observation is the only one followed, so long will the assertion remain mere rhetoric, — a consumption of time without producing its equivalent of useful effect. Let us rather remember the primary and aphorismal foundations of practical science, such as :—

" ' Science begins with the observation of common facts, but, even at this stage, requires that the observations be precise.'

" ' Facts are the materials of science, but all facts involve ideas, and since in observing facts we cannot exclude ideas, we must take care that for the purposes of science, the ideas be clear and vigorously applied. Therefore, facts for the purposes of material science should involve *conceptions* of the intellect only, and not *emotions*, and must be observed with reference to our most exact conceptions, number, place, figure, motion, force, &c.' "

III. On the Anomalous Phenomenon of the Apparent Projection of a Fixed Star on the Disk of the Moon after Apparent Immersion. By G. W. Hearn, Esq. Communicated by T. Galloway, Esq.

The author attempts to account for the anomalous phenomenon of the projection of a star on the disk of the moon before its immersion by the theory of the aberration of light. He supposes, in illustration of his theory, a screen to be placed across the *actual* direction of a ray of light proceeding from a star along the tube of a telescope ; then, though this screen might not intercept the apparent path of the ray, yet the star would certainly disappear. If, on the contrary, the screen should intercept the apparent path of the ray, and not the real path, the star would not disappear, but would appear to be projected on the screen. He imagines that the moon in the heavens is such a screen, and that by the composition of the *secular* aberration of the light of a star (by which is meant the aberration arising from the star's proper motion), with the annual aberration computed according to the usual rules, most of the anomalous phenomena of occultation may be accounted for.

He takes as examples of the application of his theory the occultations of 119 *Tauri* and 120 *Tauri*, as observed by Sir James South and Mr. F. Simms, on December 31, 1831. By supposing in the case of the first star, its proper motion, resolved perpendicularly to the line joining the star and sun, and then parallel to the ecliptic, to be equal and in the same direction as the earth's motion in its orbit, or the absolute aberration to be nothing ; and, in the case of the second star, this same resolved proper motion to be thrice the earth's motion in its orbit, and in the contrary direction, he thinks he can explain the fact of the instantaneous disappearance of the first at the moon's border, while the second was observed to disappear after being fairly within the illuminated part of the moon.

The author next discusses the case of the occultation of a planet by the moon, and takes, as an instance, the immersion of *Jupiter* and his satellites, behind the moon's dark limb, alleged to have been seen by Mr. Cornfield, at Northampton, on August 23, 1824. He then gives a general formula for finding the secular aberration deduced from the theory.

The author then proceeds to consider the indirect effect of the difference of atmospheric refraction of the light from the moon and stars in the production of the phenomenon in question, and states his views as follows :

" Admitting that light is propagated with the same velocity from each of the fixed stars, still their proper motions, combined with the probable motion of our own system and that of the earth in its orbit, must cause the relative velocities of light from the various fixed stars impinging on our atmosphere to be different, and this difference of relative velocity must produce a difference of refraction, however small that difference may be."

He lastly proceeds to shew how in certain cases this difference of refraction, though very small, may produce a very sensible effect

on the time between apparent immersion and disappearance, and investigates a mathematical formula, in which the supposed direct and indirect effects of aberration are combined, for determining the secular aberration of the star, and the amount of the difference of refraction for the moon and star.

IV. On the Longitude of the Honourable East India Company's Observatory at Madras. By T. G. Taylor, Esq.

The want of an accurate determination of the Longitude of the Madras Observatory has been greatly felt, both in an astronomical and a geographical point of view. In the former case, any error in the value assumed in the comparison of the places of the moon and planets with the tables, necessarily leads to seriously mischievous results; and in the latter, the triangles in the great trigonometrical survey of India depend for their zero upon the meridian passing through the Observatory; — the inquiry must therefore be considered one of singular importance. Mr. Goldingham, the predecessor of Mr. Taylor, had determined the longitude from no less than 230 observations of the eclipses of *Jupiter's* first and second satellite, and, before a result derived from so large a number of observations could be safely disputed, it seemed desirable to meet the inquiry with at least something like a corresponding number of observations.

The observations of moon-culminating stars were begun in 1831, on the erection of the present five-feet transit instrument, and the longitude, resulting from the observations of the first year as determined from the corresponding observations at Greenwich and Cambridge, was $5^h\ 21^m\ 3^s{\cdot}7$ or about 5^s less than the value assigned by Mr. Goldingham. At that time Mr. Taylor was not inclined to give to results obtained from moon-culminating stars that degree of credit which later experience has shewn them to deserve, from considerations connected with the probably varying error of the observations of the moon's limbs, but, as far as the present observations go, it appears that this error must be confined within narrow limits, since the semi-diameter of the moon, as measured at Madras, does not differ above half a second of space from that observed at Greenwich, Cambridge, Edinburgh, and Hamburg. Mr. Riddle, at the suggestion of Mr. Baily, undertook the reduction of the observations of the corresponding moon-culminating stars for the years 1834–1837, and the results are given in the twelfth volume of the Society's *Memoirs*.

The formula employed by him is precisely the same as that which has been used by Mr. Taylor, both in the previous as well as the present results; but there are one or two circumstances in which the treatment of the observations differs. In cases in which the full moon has happened in the interval between the moon's transiting the meridian of the Madras and the Western Observatory, it has sometimes happened that the first limb of the moon has been observed at Madras, and the second limb at the Western

Observatory; in those cases Mr. Riddle has computed the time of passage of the moon's semi-diameter from the semi-diameter given in the *Nautical Almanac*, while Mr. Taylor has rejected such cases: again, in taking the means, Mr. Riddle has given to each result a weight equal to the number of stars observed, whereas Mr. Taylor has made use of a table of weights depending upon the square root of the number, the rapidity of change of the moon's right ascension, and the relative accuracy of observations of the moon or stars.

Mr. Taylor also, having to discuss several observations of the second limb of the moon, has thought it necessary to separate these from observations of the first limb, and to treat them distinctly.

Mr. Taylor has, in the present paper, given the recomputed results for 1831–1833; so that Mr. Riddle's paper, with the present one, exhibits each single determination from corresponding observations at Greenwich and Cambridge, from 1831 to the end of 1844; and at Edinburgh, from the commencement to the end of 1839. The Hamburg observations have been taken from the *Astronomische Nachrichten*, Nos. 503, 504, and 508. To reduce each series to Greenwich, the longitudes of Cambridge and Edinburgh have been taken from the *Nautical Almanac* for 1845, and that of Hamburg from the *Connaissance des Temps* for 1840.

Finally, from 442 observations of the moon's first limb, the resulting longitude of Madras is $5^h\ 20^m\ 56^s{\cdot}38$ east, with a probable error of $\pm\ 0^s{\cdot}23$; and from 86 observations of the second limb, the result is $5^h\ 20^m\ 58^s{\cdot}19$, with a probable error of $\pm\ 0^s{\cdot}57$. Or, for the present, the most probable value is, $5^h\ 20^m\ 57^s{\cdot}28$.

V. On the Brahmin Zodiac. By W. W. Boreham, Esq. Communicated in a Letter to the Secretaries.

"I send you a rubbing from an engraved zodiac on a small silver bowl, which came into the possession of a relative of mine through the late Captain Taynton, who took it from the tent of a Burmese officer during the late war in that country.

"I cannot say that the bowl itself possesses any great antiquity; but the engraving may be regarded as traditionary evidence of the ancient Brahmin zodiac, and as such, possesses an interest.

"The Indian zodiac is well known, and engravings from it are not uncommon; but the Brahmin version of it is, I believe, not so generally given in works on the subject. Its peculiarity appears to consist principally in the retention of the fish and omission of the goat in *Capricornus:* it is alluded to by Dupuis in Lalande's *Astronomie.* The reverse of this is observed in the Greek zodiac.

"There are other minute peculiarities, but as they may be the result of the engraver's fancy I will not dwell upon them, merely observing that the fish in *Capricornus* (if it be one) does not appear

to be the peculiar sort of fish Dupuis asserts is found in that place, and which he calls a sword-fish.

"Pray excuse my trespassing upon your valuable time.

"Invented at a time when every figure was a symbol, these must still possess a meaning, which every version of them may help to explain."*

VI. Comet communications:—

1. A Communication from Professor Schumacher of Observations of Comets made at Berlin by Professor Encke.

Name of Comet.	Month and Day.	Berlin Mean Solar Time.	Right Ascension.	North Declination.	No. of Comp.	Remarks.
	1844.	h m s	° ′ ″	° ′ ″		
D'Arrest.	Dec. 28	8 8 27·0	294 9 13·5	+ 36 18 52·9	2	Piazzi, Circular Micrometer.
	1845.					
	Jan. 10	6 33 16·8	290 6 55·3	41 28 47·1	15	B. Z. and H. C.
	11	6 31 19·8	289 41 25·3	41 55 24·0	13	B. Z.
	11	7 7 11·6	289 40 29·5	41 56 7·5		B. Z.
	13	6 25 27·0	288 45 47·7	42 50 38·0	12	B. Z.
	14	7 51 12·1	288 13 49·5	43 20 56·4	10	B. Z.
	27	8 36 29·1	277 28 24·5	51 7 15·6	12	Determined at the Merid. Circle.
	28	10 37 47·9	275 57 15·9	53 57 33·4	10	H. C.
	30	8 17 45·8	272 50 18·2	53 31 9·3	10	H. C.
	Feb. 4	8 42 59·6	260 23 14·6	58 7 53·2	10	H. C.
	25	12 23 32·8	150 57 42·6	22 37 28·4	5	B. Z.
	Mar. 3	11 5 43·4	143 7 12·6	8 28 17·6	10	B. Z.
	6	11 37 51·9	140 45 29·4	3 37 27·3	18	B. Z. and H. C.
	8	9 14 1·1	139 37 21·9	+ 1 10 10·1	11	B. Z. and H. C.
	12	10 52 34·5	137 50 46·0	− 2 57 27·3	10	B. Z.
	30	10 0 39·4	135 43 56·7	11 44 24·8	5	Observed in the dark field.
Mauvais (Second).	Feb. 4	7 19 26·0	44 31 16·6	− 20 58 21·2	19	H. C.
	8	7 16 33·6	44 17 40·4	19 48 7·2	2	H. C.
	9	7 56 32·4	44 15 24·4	19 16 40·0	5	H. C.
	Mar. 6	7 52 42·7	45 24 24·1	9 43 0·9	3	Own determination.
Colla.	Feb. 25	8 6 37·9	49 27 31·0	− 13 6 10·2	2	Piazzi.
	Mar. 5	7 55 28·1	53 57 7·4	9 48 36·6	15	B. Z.
	6	7 30 39·6	55 29 47·4	8 43 45·9	2	B. Z.
	9	7 52 29·4	56 0 36·8	8 22 11·4	5	Own determination.

* See Bailly, Hist. de l'Astronomie Ancienne, pp. 157–488; Gebelin, Hist. du Calendrier, pp. 60–88; Jamieson's Celestial Atlas; Maurice, Hist. Hindostan, vol. i. p. 298.

Name of Comet.	Month and Day.	Berlin Mean Solar Time.	Right Ascension.	North Declination.	No. of Comp.	Remarks.
	1845.	h m s	° ′ ″	° ′ ″		
De Vico.	Mar. 13	10 9 33·5	145 43 34·5	+ 40 18 55·8	8	B. Z.
	15	8 22 14·8	142 33 42·7	37 13 0·0	9	B. Z.
	22	8 54 44·4	132 55 41·2	24 29 12·0	11	Own determination.
	27	11 42 32·7	127 43 59·4	14 54 36·0	12	B. Z. and H. C.
	30	8 47 24·1	125 23 28·4	9 48 2·3	10	B. Z. and H. C.
	April 1	8 32 16·5	123 59 2·2	6 27 16·3	10	Own determination.
	2	8 51 36·0	123 19 34·0	4 49 6·6	11	B. Z.
	3	8 54 37·9	122 43 4·8	3 14 39·8	10	B. Z. and H. C.
	4	8 30 19·7	122 9 16·3	+ 1 44 43·7	10	B. Z.
	6	8 51 47·3	121 6 15·4	— 1 11 2·7	15	H. C.
	7	8 20 40·5	120 38 18·7	2 32 25·8	10	Piazzi.
	13	8 24 5·2	118 21 29·1	9 56 33·8	6	Own determination.
	14	8 40 46·2	118 3 40·5	11 2 46·9	15	B. Z. and H. C.

The observations were for the most part made at the great refractor, with Fraunhofer's wire-micrometer, excepting the few, for which another mode of observation is stated in the remarks. The remarks shew from whence the stars of comparison are taken.

Piazzi.....Piazzi's Second Catalogue.
B. Z.....Bessel's Zones.
H. C.....Histoire Celeste.

2. Observations of Mauvais' Second Comet (6th series) made at the Royal Observatory, Cape of Good Hope. Communicated by G. B. Airy, Esq.

Date.	Star of Comparison.	Cape Mean Time for Right Ascension.	Difference of R. A. of Comet and Star.	No. of Obs.	Cape Mean Time for Declination.	Difference of Declination of Comet and Star.	No. of Obs.
1845.		h m s	m s		h m s	′ ″	
Feb. 16	60	9 41 33·9	+ 1 40·59	8	9 50 25·6	+ 7 22·5	4
26	61	8 48 13·9	+ 1 6·90	12	8 59 48·1	+ 7 36·8	6
Mar. 2	62	8 40 27·0	+ 1 2·17	16	8 55 53·5	+ 3 34·4	10
3	62	8 11 11·3	+ 1 21·73	18	8 27 6·6	— 14 33·7	8
4	63	8 18 50·1	— 1 22·22	18	8 34 24·9	+ 8 4·6	10
5	63	8 27 25·1	— 1 0·12	16	8 11 0·3	— 9 26·8	10
6	64	8 17 34·2	— 1 14·09	16	8 32 19·2	— 0 23·5	10
10	65	8 8 5·0	— 1 40·46	16	8 32 14·3	— 2 10·2	10

The sign + implies that the comet's right ascension or declination is greater than the star's; the sign — the contrary.

The above observations were made with the bar-micrometer attached to Dollond's 46-inch achromatic. They are not entitled to great confidence, on account of the extreme faintness of the comet.

Those made on March 2d, 3d, 4th, and 5th, are considered to be the best.

The above observations were made by Mr. Mann.

Approximate Places of the Stars of Comparison.

No. of Star.	Magnitude.	Right Ascension.	Declination.
		h m s	° ′
60	8	2 55 0	−15 52
61	9	2 57 46	12 8
62	7	2 59 9	10 54
63	9	3 2 11	10 11
64	9	3 2 49	9 43
65	9	3 4 51	− 8 39

(Signed) THOS. MACLEAR.

Royal Observatory, Cape of Good Hope,
24th March, 1845.

3. Observations of the First Great Comet of 1844–5 (Wilmot's Comet) (3d series), made at the Royal Observatory, Cape of Good Hope. Communicated by G. B. Airy, Esq.

Date.	Star of Comparison.	Cape Mean Time for Right Ascension.	Difference of R. A. of Comet and Star.	No. of Obs.	Cape Mean Time for Declination.	Difference of Declination of Comet and Star.	No. of Obs.
1845.		h m s	m s		h m s	′ ″	
Jan. 29	29	9 41 13·7	+ 0 53·22	12	9 41 13·7	− 1 31·3	12
30	30	9 51 32·7	+ 0 30·53	12			
31	31	9 37 59·7	+ 1 10·98	16	10 1 9·4	− 1 4·1	16
		10 25 23·5	+ 1 20·84	16			
Feb. 1	32	9 39 5·9	+ 3 10·27	12	10 0 54·1	− 3 2·4	10
		10 23 5·3	+ 3 19·21	12			
3	33	9 28 17·5	+ 1 12·22	16	9 49 55·4	− 6 41·1	14
		10 12 24·9	+ 1 20·42	16			
4	34	9 10 9·1	− 1 0·72	16	9 32 3·5	+ 2 8·2	16
		9 53 23·9	− 0 52·78	16			
8	35	9 34 33·3	+ 0 13·12	30	9 8 4·6	− 8 28·1	10
					9 58 14·7	− 9 55·7	10
9	36	9 12 27·7	− 0 11·05	16	9 30 19·4	+ 5 15·9	12
		9 51 44·5	− 0 5·10	16			
10	37	9 25 54·6	− 0 39·98	14	9 44 26·2	− 3 5·4	14
		10 6 28·9	− 0 34·10	8			
16	39	8 56 57·0	− 0 15·06	12	9 10 59·8	−15 30·4	10
		9 24 24·4	− 0 11·18	12			
18	40	8 54 10·9	− 2 26·72	12	9 17 12·7	− 6 15·7	10
		9 37 34·3	− 2 21·73	12			
27	41	8 19 15·8	− 0 19·00	20	8 40 56·0	+ 2 0·1	12
		9 2 56·2	− 0 14·29	20			
28	42	8 30 7·5	− 1 0·13	12	8 46 22·2	+ 4 56·8	12
		9 2 8·3	− 0 57·47	12			
Mar. 4	43	9 20 50·3	− 2 3·33	18	9 0 49·5	− 7 9·9	10
5	44	8 48 0·9	+ 1 58·02	18	9 8 43·4	+ 5 47·1	10
6	45	8 57 18·3	− 0 31·11	16	9 13 12·1	− 4 40·6	10
9	46	8 20 25·0	− 3 9·48	24	8 49 42·7	− 0 18·8	12
12	47	8 25 48·7	− 0 42·36	20	8 46 5·5	− 1 24·6	14

The observations on January 29 and 30 were made with the spider line position micrometer attached to Dollond's 46-in. achromatic, power 43; the rest with the bar-micrometer. They are not corrected for the effects of refraction and parallax.

The sign + attached to the differences of right ascension or

declination, indicates that the comet's right ascension or declination was greater than the star's; the sign — the contrary.

Approximate Places of the Stars of Comparison.

No. of Star.	Magnitude.	Right Ascension.	Declination.
		h m s	° ′
29	8	1 43 0	−29 49
30	9·10	1 48 32	28 30
31	9	1 52 41	28 14
32	9	1 55 34	27 30
33	10	2 6 35	26 4
34	9	2 12 55	25 11
35	7·8	2 27 32	22 37
36	8	2 31 35	21 43
37	8·9	2 35 32	21 13
39	8	2 54 0	17 51
40	9	3 2 10	16 35
41	8	3 22 55	12 11
42	8	3 25 52	11 42
43	3·4	3 35 50	10 18
44	7·8	3 33 53	9 42
45	7	3 38 30	9 30
46	7	3 47 8	8 21
47	7	3 50 42	− 7 24

REMARKS.

Jan. 29. The angle of position of axis of comet's tail ..... 94° 24′
The angle of position of north border of the anterior luminous matter 301 6
These measures are liable to considerable doubt, the field of view being thickly studded with small stars.

Jan. 30. The angle of position of axis of comet's tail 92 48
The angle of position of north border of the anterior luminous matter 298 30
The comet, when viewed with the "Comet Sweeper," presents the same general appearance that it did on the 27th, but it is altogether considerably fainter; the angles of position are, in consequence, rather uncertain.

Jan. 31. The angle of position of the axis of comet's tail 90 53
The angle of position of north border of anterior luminous matter 301 47

Feb. 1. The angle of position of axis of comet's tail 94 48
The angle of position of north border of anterior luminous matter 305 0

The comet is rapidly decreasing in brightness; it is now too faint to allow of the measures of position being made with any degree of accuracy.

Of the above measures, those made on Jan. 31 are the most trustworthy.

Feb. 9. The comet is now merely a bright nebulosity, nearly circular, and of about 3′ in diameter; no trace whatever of a tail or any other appendage.
Feb. 16 and 18. Bright moonlight; the comet barely visible.
Feb. 18 to 27. No observations could be obtained; the moonlight completely obliterating the comet.
Feb. 27. The comet seen again. Its appearance was a faint nebulosity, about 2′¼ in diameter, and with no apparent condensation of light.
March 13. The presence of the moon again rendered the comet invisible.

The foregoing observations were made by Mr. Mann.

(Signed) Thos. Maclear.

Royal Observatory, Cape of Good Hope,
24th March, 1845.

4. Sextant Observations of Wilmot's Comet made at sea during a voyage from Van Dieman's Land to England. By Joseph Dayman, Esq. Lieut. R.N. Communicated by Captain Beaufort.

The comet was first seen on the evening of December 27, 1844, at sea, in latitude 42° south, and longitude 129° east: observations with a sextant were repeated whenever circumstances would permit, until its disappearance to the naked eye on the 6th of February, 1845. The distances of the nucleus from those stars which formed with it, as nearly as possible, a right-angled triangle, were measured, and the mean time was noted by a chronometer.

A sketch of its appearance on the 10th of January is subjoined; and near the end of the series a sketch of the relative positions of the comet and some of the neighbouring stars with which it was compared, but of whose names the author was ignorant.

5. Sextant Observations of Wilmot's Comet made on board the barque Ceylon. By E. W. Beazley, Esq. Commander, R.N.

Observations were made on every favourable night, from December 20, 1844, to February 6, 1845. The author does not rely greatly on their accuracy on account of the unfavourable state of the weather, but considers that they may be useful as giving approximate places of the comet.

6. An Observation of the Second Great Comet of 1845 (Colla's). By C. Rumker, Esq. Communicated by Dr. Lee.

On June 9, at $12^h\ 26^m\ 44^s{\cdot}7$, Hamburg mean time, the apparent right ascension of the comet was 84° 52′ 57″·0, and its declination 45° 28′ 10″·1 north.

7. Observations of the Second Great Comet of 1845 (Colla's), made at Ashurst. By R. Snow, Esq.

The comet was first observed on June 9, and its right ascension deduced from the observation made with the transit instrument at the lower culmination was $5^h\ 40^m\ 8^s{\cdot}27$. It was also observed on

June 10, 11, and 12, and comparisons with neighbouring stars were made, which will be rendered available when the places of the comparison stars have been accurately determined.

VII. Observations of the Solar Eclipse of 1845, May 5, and of the Transit of *Mercury* of 1845, May 8, in a Letter from W. Lassell, Esq.

"*Starfield, Liverpool, 10th June*, 1845.

"I send you such observations as I have been able to make of the late solar eclipse and transit of *Mercury*, for which the weather was, in some respects, but very unfavourable.

"May 5, 1845. With a very unpromising sky I prepared to observe the first contact of the solar eclipse by placing that part of the sun's limb (then very indistinct) which the moon would first touch, between the parallel threads of the micrometer, applied to the nine-feet equatoreal, with a power of ninety-six times.

"As the time of contact approached the sky somewhat cleared, and the moon's first impression took place at $23^h\ 14^m\ 37^s{\cdot}8$ sidereal time, or $20^h\ 18^m\ 24^s{\cdot}17$ mean time at the observatory. During the greatest part of the obscuration the sky was very cloudy, but towards the end it cleared, and the last contact was well observed at $1^h\ 33^m\ 48^s{\cdot}9$ sidereal, or $22^h\ 37^m\ 12^s{\cdot}45$ mean time. No phenomena beyond what is usual occurred; nor was there, to my senses, any perceptible diminution of light on the landscape.

"May 8. For the transit of *Mercury* the appearances a short time before it began were still more unpromising. During the forenoon, we had several showers, with a most gloomy sky; and even as late as half-past three P.M. we had a smart shower of close, small rain. A little change for the better occurred shortly before four, and I had just time to set the micrometer by the sun's limb after he became visible, and get settled at the telescope, when the first notch was cut out by the planet. The sun's limb was beautifully sharp, but occasionally obscured by passing clouds. From the time, however, of the first impression until the planet had advanced about two of its diameters upon the disc of the sun, it was generally unclouded, and the atmosphere remarkably tranquil. The first contact took place at $7^h\ 13^m\ 36^s{\cdot}3$ sidereal time, or $4^h\ 8^m\ 12^s{\cdot}36$ mean time. The internal contact, or complete immersion of the planet, took place at $7^h\ 16^m\ 48^s{\cdot}7$ sidereal, or $4^h\ 11^m\ 24^s{\cdot}24$ mean time. Both times were carefully and, I believe, accurately noted. Whilst the planet was traversing the *edge* of the sun, an apparent distortion took place, the parts of the sun's edge, or limb, in contact with the planet, appearing *rounded off;* and a moment or two before the complete immersion of the planet, an appearance analogous to *Mr. Baily's beads* took place,—the planet apparently breaking contact two or three times with the sun's limb before the final separation occurred. *Mercury* had also, to my eye, somewhat of a pear-like shape previously to his

entering quite within the sun's disc. When he had advanced two or three of his diameters, the clouds rapidly thickened, and I saw him no more.

"I take this opportunity of stating, that a late redetermination of the longitude of my Observatory depending upon the lately determined longitude of the Liverpool Observatory, inclines me to adopt finally $11^m\ 47^s{\cdot}34$ as my longitude west of Greenwich, which differs scarcely a quarter of a second from that given in my paper contained in the forthcoming volume of the Society's *Memoirs*.

"The latitude I have also redetermined lately by transits of seven stars over the prime vertical, giving $53^\circ\ 25'\ 3''{\cdot}5$ as the mean result."

VIII. Observations of the Transit of *Mercury* made at Aylesbury by Thomas Dell, Esq. Communicated by Dr. Lee.

"*Transit of Mercury.*—The first contact of the two limbs was invisible, the sun being obscured by heavy clouds; but almost immediately afterwards it broke through them, and the interior contact of the limbs was well observed at $4^h\ 18^m\ 33^s$ mean time. The sun was covered by light fleecy clouds, through which it was distinctly visible, and the discs of both the sun and *Mercury* were most beautifully and sharply defined until $5^h\ 12^m$, when the whole sky became densely overcast, and continued so until after sunset. The time of interior contact is, I believe, accurate to a second, as the error of the chronometer had been determined at the sun's transit at noon."

The President then announced that, in pursuance of a resolution of the Council, which had been duly intimated to the Fellows, as required by the Bye-laws, the business of the Ordinary Meeting was now concluded, and that a Special General Meeting would immediately be held to take into consideration a subject, of which due notice had been given to the Fellows by the following circular, which he requested the Secretary to read:—

"*Somerset House, June 5th*, 1845.

"Sir,—I have the honour of notifying to you that in pursuance of a Resolution of the Council, passed on Friday, the 23d of May last, a Special General Meeting of this Society will be held at the Society's apartments on Friday, the 13th day of June instant, immediately after the business of the Ordinary Meeting to be held on that day is concluded, for the purpose of taking into consideration and deciding upon a recommendation of the Council to suspend upon that occasion the Bye-laws relative to the Election of Fellows, and to elect as Fellows of this Society the remaining Members of the Mathematical Society (now reduced to nineteen in number, of whom three are already Fellows), without payment of the usual Admission Fees and Annual Contributions (or compositions in lieu thereof), the Mathematical Society having announced

its resolution to transfer its valuable Library, with its Records and Memorials, to the Royal Astronomical Society.—I have the honour to be, sir, your most obedient servant,

"Robert Main, Secretary."

It was then moved by Professor De Morgan, and seconded by Mr. Galloway, and resolved unanimously,—

"That the recommendation of the Council in the circular now read be approved and adopted by this Meeting; and that, on the Library, Records, and Memorials of the Mathematical Society being delivered over to this Society, the following sixteen gentlemen, Members of the Mathematical Society, be admitted Fellows of the Royal Astronomical Society without payment of the admission fees or annual contributions required by the Bye-laws, viz.:

William Wilson, Esq.	Thomas K. White, Esq.
Robert Graham, Esq.	Philip James Chabot, Esq.
Robert Porrett, Esq.	Charles O. Dayman, Esq.
James Scott Bowerbank, Esq.	Thomas Cooper, Esq.
Julius Page, Esq.	John Walton, Esq.
John Williams, Esq.	Jacob Hoyer, Esq.
Henry De Berckem, Esq.	Robert Arthur Graham, Esq.
Alfred White, Esq.	Thomas Taylor, Esq.

and that the remaining three Members of the Mathematical Society, viz.:

Benjamin Gompertz, Esq.	John Lee, Esq.
John James Downes, Esq.	

or such of them as are liable to the payment of Annual Contributions, be exempted in future from such liability."

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